

REMARKS

This application has been carefully reviewed in light of the Office Action dated November 23, 2010. Claims 9, 10, 12, 13, and 15 are presented for examination, of which Claims 9 and 13 are in independent form. Claims 11 and 14 have been previously withdrawn from consideration. Applicant requests favorable reconsideration and allowance of the subject application.

The drawings have again been objected to under 37 CFR 1.83(a) for allegedly not showing the “light emitting diode die is mounted face down on the light emitting diode printed circuit board” and “rear side contacts of the light emitting diode”. Emphasis added. Applicant respectfully disagrees with the objections because the statement in the Office Action does not track the language currently recited in Claim 12, as previously pointed out in Applicant’s Response dated August 27, 2010. For example, Claim 12 recites “light emitting diode die is mounted face down to the light emitting diode printed circuit board”. Emphasis added. Moreover, with regard to the features recited in Claim 12, Applicants submit that Figures 1 to 3 show both claimed features of the light emitting diode die (3) is mounted face down to the light emitting diode printed circuit board (6) and rear side contacts (7) of the light emitting diode. Accordingly, Applicant believes that the objection has been obviated and again requests that the objection be withdrawn. If the Examiner disagrees, the Examiner is respectfully requested to contact Applicant’s undersigned attorney to resolve the objection to the drawings.

Claims 13 and 15 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicant respectfully traverses this rejection. With regard to Claim 13 the Office Action asserts that there is no antecedent basis for the recitation “the rear side

contacts of the light emitting diode" in line 12. Applicant respectfully refers the Examiner to line 4 of Claim 13, which is believed to provide antecedent basis for "the rear side contacts of the light emitting diode". With regard to Claim 15 the Office Action asserts that there is no antecedent basis for the recitation "the plurality of through-contacts of the diode" in line 3. Applicant respectfully refers the Examiner to lines 7 and 8 of Claim 13, on which Claim 15 depends, which is believed to provide antecedent basis for "the plurality of through-contacts of the diode". Accordingly, Applicants believe that Claims 12 and 15 comply fully with the requirements of 35 U.S.C. §112, second paragraph, and request that the rejections of Claims 12 and 15 be withdrawn.

Claims 9, 12 and 13 were rejected under 35 U.S.C. § 102(b) over U.S. Pat. Appln. Pub. 2002/0139990 (Suehiro et al.; hereinafter "Suehiro"). With regard to Claims 12 and 13 Applicant notes that at pages 4 and 5 the Office Action refers to Bhat et al.. Applicant has perfected his claim to priority by virtue of the submission of August 27, 2008. Accordingly, Bhat et al. (US 2005/0023548) should be removed as a reference against this application, since its filing date is later than the perfected priority date. Accordingly, Applicant proceeds with the following response with the understanding that the reference to Bhat et al. in the Office Action is likely an error and should instead refer to Suehiro. If Applicant's understanding is not correct, the Examiner is respectfully requested to contact Applicant's undersign attorney to resolve which reference the Examiner is referring to in formulating the rejections of Claims 12 and 13.

Also, Claims 10 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Suehiro in view of U.S. Pat. Appln. Pub. 2002/0149312 (Roberts et al.; hereinafter "Roberts") and Claim 15 was rejected over Suehiro. Applicant respectfully

traverses the rejections of the claims and submits that independent Claims 9 and 13, together with the claims dependent therefrom, are patentably distinct from the cited art for at least the following reasons.

Claim 9 is directed to a light emitting diode that includes at least one light emitting diode die, arranged on a light emitting diode printed circuit board by means of a die attach. The light emitting diode printed circuit board includes rear side contacts at a lower surface of the printed circuit board. The rear side contacts at least partially overlap with contours of the light emitting diode die and are formed in such a way as to overlap with at least half of the lower surface of the printed circuit board. The printed circuit board comprises a plurality of through-contacts thermally and electrically connecting the rear side contacts to contact areas formed on an upper surface of the printed circuit board.

One feature of Claim 9 is that the rear side contacts at least partially overlap with contours of the light emitting diode die and are formed in such a way as to overlap with at least half of the lower surface of the printed circuit board. Nothing has been found in the applied references or cited to by the Office that is seen to teach or suggest this feature of Claim 9.

Proportions of features in a drawing are not evidence of actual proportions when drawings are not to scale. Applicant respectfully refers the Examiner to MPEP §2125, which states, in part:

When the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. See Hockerson-Halberstadt, Inc. v. Avia Group Int'l, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000) (The disclosure gave no indication that the drawings were drawn to scale. "It is well established that patent drawings do not define the precise proportions of the elements and may not be

relied on to show particular sizes if the specification is completely silent on the issue."). However, the description of the article pictured can be relied on, in combination with the drawings, for what they would reasonably teach one of ordinary skill in the art. In re Wright, 569 F.2d 1124, 193 USPQ 332 (CCPA 1977) ("We disagree with the Solicitor's conclusion, reached by a comparison of the relative dimensions of appellant's and Bauer's drawing figures, that Bauer 'clearly points to the use of a chime length of roughly 1/2 to 1 inch for a whiskey barrel.' This ignores the fact that Bauer does not disclose that his drawings are to scale. ... However, we agree with the Solicitor that Bauer's teaching that whiskey losses are influenced by the distance the liquor needs to 'traverse the pores of the wood' (albeit in reference to the thickness of the barrelhead)" would have suggested the desirability of an increased chime length to one of ordinary skill in the art bent on further reducing whiskey losses." 569 F.2d at 1127, 193 USPQ at 335-36.) Emphasis Added.

In that regard, the Office Action does not provide any explanation of how or why the figures of Suehiro should be interpreted as being drawn to scale to show that the rear side contacts at least partially overlap with contours of the light emitting diode die and are formed in such a way as to overlap with at least half of the lower surface of the printed circuit board. Applicant respectfully requests an indication of the basis for the Examiner's assumption regarding the dimensional relationship between the alleged rear side contacts and the alleged lower surface of the printed circuit board in the figures of Suehiro. Notwithstanding such explanation, Applicant submits that Suehiro is not believed to expressly or inherently disclose that the rear side contacts at least partially overlap with contours of the light emitting diode die and are formed in such a way as to overlap with at least half of the lower surface of the printed circuit board as provided for in Claim 9.

As understood by Applicant, the Office Action equates a bottom portion of the conductive pattern 4 of Suehiro with the rear side contacts referred to in Claim 9. (see

Figures 2A, 2b, 8 and 9). However, contrary to the noted feature of Claim 9, the bottom portion of the conductive pattern 4 shown in Figures 2A, 8, and 9 of Suehiro is not seen to teach that the rear side contacts at least partially overlap with contours of the light emitting diode die and are formed in such a way as to overlap with at least half of the lower surface of the printed circuit board.

In this regard Applicant notes that Figures 2A and 9 of Suehiro are sectional side views of the LED arrangement. Applicant submits that such side views would not enable one of ordinary skill in the art to make an assessment of the extent of the alleged rear side contacts 4 in a direction perpendicular to the plane of projection of the figures. Moreover, Figures 2A and 8 of Suehiro relate to plan views of the LED arrangement which do not enable an assessment of the shape or dimension of the rear side contacts arranged at a lower surface of the substrate 3. Thus, conjecture, speculation, and impermissible hindsight reasoning would be needed to conclude that the figures of Suehiro teach or suggest that the rear side contacts at least partially overlap with contours of the light emitting diode die and are formed in such a way as to overlap with at least half of the lower surface of the printed circuit board.

Therefore, Applicant submits that Suehiro cannot disclose rear side contacts at least partially overlap with contours of the light emitting diode die and are formed in such a way as to overlap with at least half of the lower surface of the printed circuit board.

Another feature of the light emitting diode of Claim 9 is that the printed circuit board comprises a plurality of through-contacts thermally and electrically connecting the rear side contacts to contact areas formed on an upper surface of the printed circuit board.

As understood by Applicant, the Office Action equates a central portion of the bottom portion of the conductive pattern 4 shown in Figure 2A of Suehiro with the “plurality of through-contacts thermally and electrically connecting the rear side contacts to contact areas formed on an upper surface of the printed circuit board” as recited in Claim 9. Applicant respectfully disagrees with the Office Action that Suehiro discloses a plurality of through-contacts.

Applicant notes that one of ordinary skill in the art would likely understand that in the technical field of electronic conductors, through-contacts respectively 'VIAs' ('Vertical Interconnect Access') refer to a vertical electrical connection between different layers of conductors in a printed circuit board which consists of two pads, in corresponding positions on different layers of the board, that are electrically connected by means of a hole through the board.

At page 4, lines 8 to 11, the Office Action states that “the printed circuit board comprises a plurality of through-contacts 4 (center portion) thermally and electrical [sic] connecting the real [sic] side contacts to contact areas 4 (upper portion) formed on an upper surface of the printed circuit board.” As described in paragraph [0079] of Suehiro, referring to features which are common to the embodiments shown Figures 1A and 2A, the alleged printed circuit board (substrate 3) comprises only one through-hole 5 filled with a solder 6 acting as a metal (heat radiation conductive member). Paragraph [0079] also describes electrical connections of rear surface electrodes of light emitting element 2 through use of gold bumps 7a and 7b. However, only bump 7a is electrically connected to the through-hole 5, while bump 7b is electrically connected to the side to conductive pattern 4, which is electrically isolated from the through-hole 5 by gap 4a. See paragraph

[0080]. Thus, Suehiro is not seen to disclose “a plurality of through-contacts thermally and electrically connecting the rear side contacts to contact areas formed on an upper surface of the printed circuit board” as recited in Claim 9, since the center portion within the through-hole 5 to which the Office Action refers appears to connect only one rear surface electrode.

For at least the foregoing reasons, Claim 9 is believed to be clearly allowable over Suehiro and Applicant respectfully requests withdrawal of the rejection under 35 U.S.C. § 102(b).

Independent Claim 13 recites features similar to those discussed above with respect to Claim 9. Claim 13 is believed to be patentable over Suehiro for at least the same reasons discussed above in connection with Claim 9.

A review of the other art of record has failed to reveal anything that, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Therefore, those claims are respectfully submitted to be patentable over the art of record.

The other claims in this application depend from one or another of the independent claims discussed above, and, therefore, are submitted to be patentable over the art relied on in the Office Action for the same reasons.

Applicant's undersigned attorney may be reached in our Costa Mesa, CA office by telephone at (714) 540-8700. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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